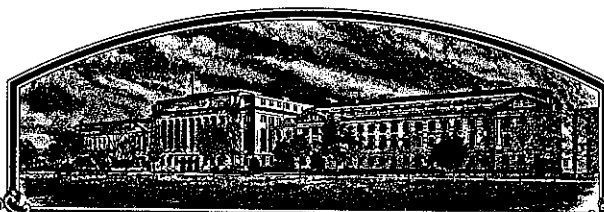


No.

8700112



# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

**Northrup King Co.**

Whereas, THERE HAS BEEN PRESENTED TO THE

**Secretary of Agriculture**

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S), AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (ACT, 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

SOYBEAN

'S44-77'



In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D. C. this 18th day of December in the year of our Lord one thousand nine hundred and eighty-seven.

Attest:

*Kenneth H. Evans*  
Commissioner  
Plant Variety Protection Office  
Agricultural Marketing Service

*Richard E. Lyng*  
Secretary of Agriculture

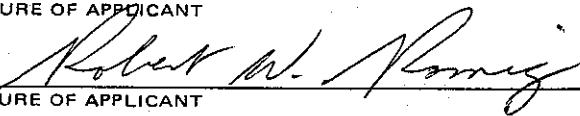
U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE

FORM APPROVED: OMB NO. 0581-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

## APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

1. NAME OF APPLICANT(S) Northrup King Co.		2. TEMPORARY DESIGNATION J015140		3. VARIETY NAME S44-77	
4. ADDRESS (Street and No. or R.F.D. No., City, State, and Zip Code) P. O. Box 959 Minneapolis, MN 55440		5. PHONE (Include area code) 612-593-7333		FOR OFFICIAL USE ONLY VPPO NUMBER 8700112	
6. GENUS AND SPECIES NAME Glycine max		7. FAMILY NAME (Botanical) Leguminosae		FILING DATE April 2, 1987 TIME 9:30 <input checked="" type="checkbox"/> A.M. <input type="checkbox"/> P.M.	
8. KIND NAME Soybean		9. DATE OF DETERMINATION March, 1986		FEES RECEIVED AMOUNT FOR FILING \$ 1800.00 DATE April 2, 1987 AMOUNT FOR CERTIFICATE \$ 200.00 DATE November 9, 1987	
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation				12. DATE OF INCORPORATION 1986	
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Delaware					
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Robert W. Romig Northrup King Co. P. O. Box 959 Minneapolis, MN 55440 PHONE (Include area code): 612-593-7305					
14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED					
a. <input checked="" type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)					
b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement.					
c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of Variety (Request form from Plant Variety Protection Office.)					
d. <input checked="" type="checkbox"/> Exhibit D, Additional Description of Variety.					
e. <input checked="" type="checkbox"/> Exhibit E, Statement of the Basis of Applicant's Ownership.					
15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act.) <input type="checkbox"/> Yes (If "Yes," answer items 16 and 17 below) <input checked="" type="checkbox"/> No					
16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input type="checkbox"/> Foundation <input type="checkbox"/> Registered <input type="checkbox"/> Certified		
18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.? <input type="checkbox"/> Yes (If "Yes," give date) <input checked="" type="checkbox"/> No					
19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES? <input type="checkbox"/> Yes (If "Yes," give names of countries and dates) <input checked="" type="checkbox"/> No					
20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable. The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.					
SIGNATURE OF APPLICANT 				DATE MARCH 30, 1987	
SIGNATURE OF APPLICANT				DATE 1	

## EXHIBIT A

## Origin and Breeding History of the Variety

- 1977-79. The Northrup King soybean research group at Washington, Iowa made the cross 'A2575' x 'Mack' and advanced the population to  $F_6$ . We practiced mass-selection for Group IV or earlier maturity in the  $F_3$  generation. In October, 1979, we harvested 100 plants of Group IV or earlier maturity and threshed them individually.
1980. We grew each of the 100 plant selections in an  $F_7$  progeny row. One of these, numbered J015140, was selected based on agronomic appearance to be tested in a preliminary yield trial. This line was subsequently named S44-77.
- 1981-84. We tested S44-77 in replicated yield trials at several mid-western locations and found it to yield well in comparison to other Group IV varieties. We identified and confirmed the descriptive characteristics purple flowers, grey pubescence, tan pods, buff hila, and dull seedcoat luster. We tested S44-77 for resistance to Races 1, 2, 3, 4, and 7 of Phytophthora megasperma by inoculation of detached cotyledons and found it to be resistant to Races 1, 2, 3, and 7, and susceptible to Race 4.
- In 1984 the Northrup King soybean research group at St. Joseph, Illinois, initiated seed increase from 500 grams of carefully hand-rogued seed. We removed all plants not conforming to the variety description by roguing the increase block several times. Growth and maturity were uniform.
- 1985-86. We continued to test S44-77 in advanced yield trials to confirm descriptive characteristics and performance.

We grew Breeder Seed of S44-77 in 1985 from the initial increase made in 1984. The field was rogued several times. We produced Foundation Seed of S44-77 in 1986. The Iowa Crop Improvement Association inspected the field and found it to meet the requirements for Foundation Seed. S44-77 was approved for eligibility for certification by the National Soybean Variety Review Board on December 11, 1986.

S44-77 is a stable and uniform soybean variety except that it has both the A and B bands for B-amylase. It is uniform for normal descriptive characteristics except for minor, environmentally induced variation normally encountered in a soybean variety.

We will maintain varietal purity by use of progeny rows as needed.

## EXHIBIT B

## Novelty Statement for the Variety

Soybean variety S44-77 is most similar to Mitchell.  
It can be differentiated from Mitchell on the basis  
of reaction to Race 3 of Phytophthora megasperma.  
S44-77 is resistant while Mitchell is susceptible.

U.S. DEPARTMENT OF AGRICULTURE  
 AGRICULTURAL MARKETING SERVICE  
 LIVESTOCK, MEAT, GRAIN & SEED DIVISION  
 PLANT VARIETY PROTECTION OFFICE  
 BELTSVILLE, MARYLAND 20705

EXHIBIT C  
 (Soybean)

**OBJECTIVE DESCRIPTION OF VARIETY**  
**SOYBEAN (*Glycine max* L.)**

NAME OF APPLICANT(S) Northrup King Co.	TEMPORARY DESIGNATION J015140	VARIETY NAME S44-77
ADDRESS (Street and No., or R.F.D. No., City, State, and Zip Code) P. O. Box 959 Minneapolis, MN 55440 Attention: Robert W. Romig		FOR OFFICIAL USE ONLY PVPO NUMBER 8700112

Choose the appropriate response which characterizes the variety in the features described below. When the number of significant digits in your answer is fewer than the number of boxes provided, place a zero in the first box when number is 9 or less (e.g., 0 9).

**1. SEED SHAPE:**

2



1 = Spherical (L/W, L/T, and T/W ratios = < 1.2)  
 3 = Elongate (L/T ratio > 1.2; T/W = < 1.2)

2 = Spherical Flattened (L/W ratio > 1.2; L/T ratio = < 1.2)  
 4 = Elongate Flattened (L/T ratio > 1.2; T/W > 1.2)

**2. SEED COAT COLOR: (Mature Seed)**

1

1 = Yellow      2 = Green      3 = Brown      4 = Black      5 = Other (Specify) \_\_\_\_\_

**3. SEED COAT LUSTER: (Mature Hand Shelled Seed)**

1

1 = Dull ('Corsoy 79'; 'Braxton')      2 = Shiny ('Nebsoy'; 'Gasoy 17')

**4. SEED SIZE: (Mature Seed)**

1 6

Grams per 100 seeds

**5. HILUM COLOR: (Mature Seed)**

1

1 = Buff      2 = Yellow      3 = Brown      4 = Gray      5 = Imperfect Black      6 = Black      7 = Other (Specify) \_\_\_\_\_

**6. COTYLEDON COLOR: (Mature Seed)**

1

1 = Yellow      2 = Green

**7. SEED PROTEIN PEROXIDASE ACTIVITY:**

2

1 = Low      2 = High

**8. SEED PROTEIN ELECTROPHORETIC BAND:**

1 = Type A (SP1<sup>a</sup>)      2 = Type B (SP1<sup>b</sup>)

Both bands present.

**9. HYPOCOTYL COLOR:**

4

1 = Green only ('Evans'; 'Davis')      2 = Green with bronze band below cotyledons ('Woodworth'; 'Tracy')  
 3 = Light Purple below cotyledons ('Beeson'; 'Pickett 71')  
 4 = Dark Purple extending to unifoliate leaves ('Hodgson'; 'Coker Hampton 266A')

**10. LEAFLET SHAPE:**

3

1 = Lanceolate      2 = Oval      3 = Ovate      4 = Other (Specify) \_\_\_\_\_

4

## 11. LEAFLET SIZE:

☐ 21 = Small ('Amsoy 71'; 'A5312')  
3 = Large ('Crawford'; 'Tracy')

2 = Medium ('Corsoy 79'; 'Gasoy 17')

## 12. LEAF COLOR:

☐ 21 = Light Green ('Weber'; 'York')  
3 = Dark Green ('Gnome'; 'Tracy')

2 = Medium Green ('Corsoy 79'; 'Braxton')

## 13. FLOWER COLOR:

☐ 2

1 = White

2 = Purple

3 = White with purple throat

## 14. POD COLOR:

☐ 1

1 = Tan

2 = Brown

3 = Black

## 15. PLANT PUBESCENCE COLOR:

☐ 1

1 = Gray

2 = Brown (Tawny)

## 16. PLANT TYPES:

☐ 21 = Slender ('Essex'; 'Amsoy 71')  
3 = Bushy ('Gnome'; 'Govan')

2 = Intermediate ('Amcor'; 'Braxton')

## 17. PLANT HABIT:

☐ 3

1 = Determinate ('Gnome'; 'Braxton')

2 = Semi-Determinate ('Will')

3 = Indeterminate ('Nebsoy'; 'Improved Pelican')

## 18. MATURITY GROUP:

☐ 7

1 = 000

2 = 00

3 = 0

4 = I

5 = II

6 = III

7 = IV

8 = V

9 = VI

10 = VII

11 = VIII

12 = IX

13 = X

## 19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

## BACTERIAL DISEASES:

☐Bacterial Pustule (*Xanthomonas phaseoli* var. *sojensis*)☐Bacterial Blight (*Pseudomonas glycinea*)☐Wildfire (*Pseudomonas tabaci*)

## FUNGAL DISEASES:

☐ 1Brown Spot (*Septoria glycines*)Frogeye Leaf Spot (*Cercospora sojina*)☐

Race 1

☐

Race 2

☐

Race 3

☐

Race 4

☐

Race 5

☐

Other (Specify)

☐Target Spot (*Corynespora cassiicola*)☐ 1Downy Mildew (*Peronospora trifoliorum* var. *manshurica*)☐Powdery Mildew (*Microsphaera diffusa*)☐ 1Brown Stem Rot (*Cephalosporium gregatum*)☐Stem Canker (*Diaporthe phaseolorum* var. *caulivora*)

## 19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant) (Continued)

## FUNGAL DISEASES: (Continued)

<input checked="" type="checkbox"/> 1	Pod and Stem Blight ( <i>Diaporthe phaseolorum</i> var. <i>sojae</i> )												
<input checked="" type="checkbox"/> 1	Purple Seed Stain ( <i>Cercospora kikuchii</i> )												
<input checked="" type="checkbox"/> 1	Rhizoctonia Root Rot ( <i>Rhizoctonia solani</i> )												
Phytophthora Rot ( <i>Phytophthora megasperma</i> var. <i>sojae</i> )													
<input checked="" type="checkbox"/> 2	Race 1	<input checked="" type="checkbox"/> 2	Race 2	<input checked="" type="checkbox"/> 2	Race 3	<input checked="" type="checkbox"/> 1	Race 4	<input checked="" type="checkbox"/> 1	Race 5	<input checked="" type="checkbox"/> 2	Race 6	<input checked="" type="checkbox"/> 2	Race 7
<input checked="" type="checkbox"/> 2	Race 8	<input checked="" type="checkbox"/> 2	Race 9	<input type="checkbox"/>	Other (Specify) _____								

## VIRAL DISEASES:

<input type="checkbox"/>	Bud Blight (Tobacco Ringspot Virus)
<input type="checkbox"/>	Yellow Mosaic (Bean Yellow Mosaic Virus)
<input type="checkbox"/>	Cowpea Mosaic (Cowpea Chlorotic Virus)
<input type="checkbox"/>	Pod Mottle (Bean Pod Mottle Virus)
<input type="checkbox"/>	Seed Mottle (Soybean Mosaic Virus)

## NEMATODE DISEASES:

Soybean Cyst Nematode ( <i>Heterodera glycines</i> )									
<input checked="" type="checkbox"/> 1	Race 1	<input checked="" type="checkbox"/> 1	Race 2	<input checked="" type="checkbox"/> 1	Race 3	<input checked="" type="checkbox"/> 1	Race 4	<input type="checkbox"/>	Other (Specify) _____
<input type="checkbox"/>	Lance Nematode ( <i>Hoplolaimus Colombus</i> )								
<input type="checkbox"/>	Southern Root Knot Nematode ( <i>Meloidogyne incognita</i> )								
<input type="checkbox"/>	Northern Root Knot Nematode ( <i>Meloidogyne Hapla</i> )								
<input type="checkbox"/>	Peanut Root Knot Nematode ( <i>Meloidogyne arenaria</i> )								
<input type="checkbox"/>	Reniform Nematode ( <i>Rotylenchulus reniformis</i> )								
<input type="checkbox"/>	OTHER DISEASE NOT ON FORM (Specify): _____								

## 20. PHYSIOLOGICAL RESPONSES: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

<input checked="" type="checkbox"/> 1	Iron Chlorosis on Calcareous Soil
<input type="checkbox"/>	Other (Specify) _____

## 21. INSECT REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

<input type="checkbox"/>	Mexican Bean Beetle ( <i>Epilachna varivestis</i> )
<input type="checkbox"/>	Potato Leaf Hopper ( <i>Empoasca fabae</i> )
<input type="checkbox"/>	Other (Specify) _____

## 22. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED.

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant Shape	Mitchell	Seed Coat Luster	S1492
Leaf Shape	S42-40	Seed Size	Mitchell
Leaf Color	Mitchell	Seed Shape	Mitchell
Leaf Size	S39-99	Seedling Pigmentation	Hodgson

## 23. GIVE DATA FOR SUBMITTED AND SIMILAR STANDARD VARIETY: Paired Comparison Data

VARIETY	NO. OF DAYS MATURITY	PLANT LODGING SCORE	CM PLANT HEIGHT	LEAFLET SIZE		SEED CONTENT		SEED SIZE G/100 SEEDS	NO. SEEDS/POD
				CM Width	CM Length	% Protein	% Oil		
Submitted	135	3.0	111	6.2	11.3	42.7	22.6	15.5	2-3
Mitchell Name of Similar Variety	137	3.2	110	7.4	11.7	41.4	21.0	15.4	2-3

## PUBLICATIONS USEFUL AS REFERENCE AIDS FOR COMPLETING THIS FORM:

1. Caldwell, B.E., ed. 1973. Soybeans: Improvement, Production, and Uses. Amer. Soc. Agron. Monograph No. 16.
2. Buttery, B.R. and R.I. Buzzell. 1968. Peroxidase activity in seeds of soybean varieties. Crop Sci., 8: 722-725.
3. Hymowitz, T. 1973. Electrophoretic analysis of SBTI-A<sub>2</sub> in the USDA soybean germplasm collection. Crop Sci., 13: 420-421.
4. Payne, R.C. and L.F. Morris. 1976. Differentiation of soybean cultivars by seedling pigmentation patterns. J. Seed Technol. 1: 1-19.



## EXHIBIT D

## Additional Description of the Variety

Soybean variety S44-77 is a mid Group IV cultivar maturing between Williams 82 and Mitchell. It exhibits long hypocotyl reaction when grown in 4.5 inches of sand at 77° F. for 14 days. It has the Rps 1-C gene for resistance to Races 1-3, 6-10 of Phytophthora megasperma.

## EXHIBIT E

## Statement of the Basis of Applicant's Ownership.

Soybean variety S44-77 was developed by the Northrup King Co. soybean breeding staff from germplasm sources cited in Exhibit A of this application. Northrup King Co. believes that the variety is novel as defined in the Plant Variety Protection Act and, therefore, that Northrup King is the sole owner of the variety.